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Proposal to Study the Learning Styles of Native Students in the Northwest Territories

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Abstract

A review of the literature on Native student learning styles presents a mixed picture of extremely general statements. In summary, Native students have been found to be field-independent (FID), holistic/global and simultaneous in their thinking. These general findings do not provide the theoretical guidance and the level of specificity necessary for the development of curriculum guidelines and remedial programs for Native students. A developmental theory is presented (and described fully in the accompanying paper) which provides this kind of theoretical guidance. The theory is focussed on the strengths of Native students in that the development of symbolic competence is highlighted. Specifically, the theory describes the development of metaphorical thinking, including FID, holistic/global and simultaneous components. The educational significance of the theory is found in the consequence of this kind of development for students' ability to generalize knowledge, increasingly, to broader contexts of experience and problem types. Students become more adaptive to changing life situations. They are able to apply prior knowledge in contexts that have not been instructed beforehand. Although this is a universal cognitive ability, the claim here is that Native students have a "strength" or exhibit a characteristic cognitive style in this regard. The developmental theory provides a "yardstick" by which individual Native student performance can be compared to Native student group performance thereby making it possible to identify individuals who are potentially at risk academically relative to their cohorts. On this basis,

remedial programs can be clearly defined and evaluated with respect to acquired "gains" represented as movement on the developmental scale as well as improved classroom performance. Several objectives for the proposed study are stated explicitly as are the anticipated outcomes. As a first objective, the study would establish that Native students do indeed have a unique cognitive style but that this is a matter of degree compared to non-Native students, not a difference of kind of thinking. We would show that Native students are more proficient in their ability to make generalizations, i.e., think metaphorically compared to non-Native students. We would show that this kind of "strength" is found in the literature in the observation that Native students are more FID than FD, more holistic/global than analytic and more simultaneous than successive. Native students should have an easier time getting "the big picture" given these kinds of results. The pedagogical implications of these results extend to the development of curriculum guidelines as well as to suggestions for remedial programming. A research design is presented whereby Native and non-Native students would be compared across three grade levels, one, three and five. Sixty-four students from each grade level split evenly between Native and non-Native students would be assessed. Half of the Native student group would be Inuit and half Native Indian. All groups would be balanced for the sex of the participants. Results would indicate 1) whether Native and non-Native students have a similar "strength" in their ability to generalize, and 2) whether neurological development has an impact on these results. For example, Native students as compared to non-Native students might become better performers as a function of increasing age. Results would also indicate 3) whether Inuit and Native Indian students perform differently, 4) whether the sex of the student has a bearing on the results, and 5) whether the range of individual differences is comparable for both Native and non-Native groups. Finally, classroom performance in various subject areas would be compared to the assessment results for all groups in order to ascertain the nature of the relationship between the cognitive style variable and school achievement. Following on the evaluation of these results, the second and third objectives of the study could be

undertaken. These objectives are directed to instructional and remedial issues. The most important question in these objectives is how to translate the cognitive advantages described above into procedures that tap directly into Native students' preferred learning styles. This no-nonsense approach to learning styles will benefit the majority of students in the Northwest Territories.

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Background To The Problem

It is important not to beg the question of learning styles in a proposal dedicated to an investigation of the way Native students learn. By this, I mean that it would be wrong to go ahead on the assumption that learning style differences are there to be found. Indeed the extent to which learning style differences significantly impact upon classroom activities in the context of the Northwest Territories educational system is part of the research question.

Some clarification of the meaning of the term "learning style" is necessary before the specifics of the proposal can be addressed. For example, a learning style may be viewed as a way of behaving which helps individuals and groups to cope with (adapt to) prevailing problems in their immediate environment. On the other hand, learning styles may develop from early attempts to adapt in the face of the emergence of new cultural influence: for the immigrant these typically are initial 'Westernization' while still at home (e.g., by education, telecommunications), and the whole set of new influences which inundate him or her on arrival in the new setting. The reason for distinguishing these two broad sets of influences is that what may be adaptive in the traditional setting may not be adaptive in the new one. The extention of this discussion to Native student learning is perhaps obvious but the point needs to be made that an investigation into the learning styles of Native students must at some level consider the various influences of cultural heritage on the learning process itself.

On this last point, there has been a considerable amount of research which regards learning style as an internal cognitive process. the concern in such studies is to

describe the cognitive processes by which the learner remembers and understands information. Terms such as impulsive/reflective, verbal/nonverbal, global/analytic and field dependent/field independent are common to these studies. However, the word "style" is used quite differently by various researchers. For some researchers, style refers to a pervasive psychological characteristic that cuts across intellectual, perceptual and interpersonal functioning (Witkin and Berry, 1975; Keefe, 1979). For others, style is the "usual" or "preferred" manner of learning (Satterley & Brimer, 1972; Mamchur, 1981). Others consider style as the "best" or "most effective" manner in which a person learns (Hunt, 1987). More (1986) prefers to use the word style as the "characteristic" manner in which a learner functions. For example, the characteristic manner in which some Native students may learn to read may not necessarily be effective or even the usual one preferred. This last usage of style suggests that particular learning styles may be operative within particular domains of tasks and not "across the board" of various classroom tasks.

The study of learning styles arose from the study of individual differences. As educators and researchers tried to understand the tremendous range of individual differences between children, they began to look for the sources for these differences. One of these significant sources was cultural differences (Berry, 1976). According to Lesser, "people who share a common cultural background will also share to a certain extent, common patterns of intellectual abilities, thinking styles and interests" (1976, p. 137). Messick (1976) concluded that ethnic groups, independent of socioeconomic status, display characteristic patterns of abilities that are strikingly different from one another. This position does not deny the importance of individual differences. It should be clear that individuals may be different from one another in cognitive style; to the extent that ecological and cultural factors play a communal role, we may also say that groups are likely to differ in cognitive style as well.

A review of research on various cognitive styles (Goldstein & Backman, 1978) makes it clear that only one approach has received any substantial treatment in the

cross-cultural field, that of field dependence - field independence (Witkin et al., 1962; Witkin & Goodenough, 1981).

This particular cognitive style includes not only cognitive (intellectual or perceptual), but also some social and emotional characteristics; this makes it a particularly useful approach to understanding the individual as a whole. The central feature of this style is the 'extent of autonomous functioning' (Witkin, Goodenough, & Oltman, 1979); that is, whether an individual characteriscally relies on the external environment as a given, in contrast to working on it, is the key dimension along which individuals may be placed. As the name suggests, those who tend to accept or rely upon the external environment are relatively more Field Dependent (FD), while those who tend to work on it are relatively more Field Independent (FID). The construct is a dimension, the poles of which are defined by the two terms, FD-FID; individuals have a characteristic 'place' on this dimension, reflecting their usual degree of autonomy (Witkin & Goodenough, 1981). However, individuals are not 'fixed' into this usual place, since relatively more field-independent people may shift to a more field-dependent approach as the situation warrants; this 'mobility' of cognitive style is an important feature. Moreover, specific training has also been shown to affect one's usual style or approach.

This most recent conceptualization, which draws together perceptual, cognitive and social characteristics, is much broader than the original use of the term by Witkin et al., (1962). Over the course of research the field dependent-independent dimension has referred to a series of components which has evolved as the research programme advanced. Initially it included only the contrasting ways in which individuals establish the upright in tests involving tilted frames or tilted rooms; more field dependent people tended to rely upon the external frame, while more field independent persons tended to rely upon internal standards. Later on it came to include the tendency to separate or disembed a small item from a larger context; more field dependent individuals had difficulty in overcoming the embedding context, while those more field independent found

it easier to overcome the influence of the organized complex. Later still, the dimension grew to include the articulated-vs-global field approach. Here, cognitive tasks were presented whose solution depended upon taking an essential element out of the context in which it was presented, and on restructuring the problem material so that the element became used in a different context; more field-dependent persons were less likely to restructure (and hence not solve) the problem, whereas more field independent persons did restructure and more often arrived at a correct solution. Most recently the whole area of autonomy in social behaviour and interpersonal competencies has come to be included in the FD-FID cognitive style as well: those who are more field dependent tend to accept social influence more, and to be more competent in social relations, while those more field independent tend to be more independent of social influence, and to exhibit less social competence.

The current conceptualization of the field dependent-field independent cognitive style is that arrived at by Witkin and Goodenough (1981): autonomy of external referents in perceptual and social behaviour. It has two indicators or components which are termed 'restructuring skills' and 'limited interpersonal competencies.' The field dependent-independent cognitive style is thus a pervasive dimension of individual functioning, showing itself in the perceptual, intellectual, personality and social domains (Witkin and Goodenough, 1981), and it tends to be relatively stable over time and across situations. It 'involves individual differences in process rather than content variables; that is to say, it refers to individual differences in the "how" rather than the "what" of behaviour' (Witkin & Goodenough, 1981, p. 57). Since it refers to the 'how' of one's behaviour, the field dependence-independence construct avoids some of the difficulties of the 'ability' approach, where the focus is on the 'how much': this is particularly important in the use of the dimension cross-culturally.

Native Student Learning Styles

Despite a great deal of interest in learning styles by educators and the native Indian community, only a limited amount of research has been carried out. One group of studies dealt with modality and perceptual abilities (MacArthur, 1973, 1978). A much larger group of studies dealt with bipolar distributions, such as field dependence/field independence (Weitz, 1971) and global/analytic processing (Das et al., 1979; More, 1984). A small number of studies was concerned with teaching and communication styles (Erikson & Mohatt, 1982; Scollon & Scollon, 1983). Very little research has been done on traditional Indian learning styles although two studies (Vernon, 1969, & Weitz, 1971) related general traditional cultures to learning style.

Kaulback recently reviewed studies of the performance of Indian students on visual, auditory, and kinesthetic perceptual tasks (1984). Most of his studies involved American Indians and Eskimos. He interpreted the results of studies with the Draw-A-Man tests and the Illinois Test of Psycholinguistic Abilities as supporting the hypothesis that "Indian and Inuit children are most successful at processing visual information and have the most difficulty performing well on tasks saturated with verbal content.... (However) it is too premature to imply from these results alone that Native children are deficit in their ability to conceptualize through language" (ibid, p. 30).

Vernon found that the most highly developed abilities for Canadian Inuit and northern Indian students were perceptual and spatial abilities (1969). Bowd (1971) found that Native boys had well-developed spatial/mechanical abilities.

These studies relate only indirectly to learning styles in that they are concerned with learning abilities not style. The studies imply that the students USUALLY use their best abilities, but this was not assessed directly.

MacArthur (1968) found that Canadian Eskimos and northern Indians, as representatives of hunting/gathering societies were more FI, that is, more able to impose a structure on a field when it has little inherent organization (e.g., unmapped territory).

as a result of their living style and child rearing practices.

Weitz (1971) studied two Indian cultural groups, Algonkian and Athapaskan, and within these groups separated out urban, transitional and traditional groups as well as male-female and older-younger. She found that the overall group scored very high on FI and the more traditional people were more FI than urban Indian people. She also found that FI increased with age and that females were more FI than males. A recent study by More (1984) found that FI increased with age for school age children.

The relational/analytical style has been used to study how individuals relate in groups. The more formal and complex the group, the more analytical they became. Koenig (1981) analyzed responses of Indian, Metis, Inuit and non-Native subjects according to their relational and analytic styles. Koenig found that the Native subjects tended to think in relational styles whereas the non-Native subjects tended to think in analytic styles. The results also showed the Indian and Inuit subjects somewhat more analytical than the Metis subjects.

The simultaneous/successive cognitive processing dimension put forward by Das et al. (1975, 1979) based on neurological work by Luria (1966), has attracted a great deal of research interest. Some recent results are particularly significant to teaching Indian children.

Simultaneous processing refers to the synthesis of separate elements into a group, or perceiving things as a whole -- a holistic, global process. Successive processing refers to processing information in a serial or sequential order -- an analytic, ordered process (Das et al., 1975). For example, in early reading, sight word vocabulary uses simultaneous processing and phonics uses successive processing.

Krywaniuk (1974) tested low achieving, grade three Indian and white children and found that even though their general ability scores were equivalent, the Indian students scored higher on simultaneous measures and lower on successive measures than the white students. He also found that although both groups showed a similar factor

structure, different factor loadings indicated that the Indian students were processing some of the tasks quite differently from the whites. Similar results were also obtained by Das, Manos, & Kanungo (1975). Kaufman & Kaufman (1983, pp. 152-4) found similar results with Navajo children but not with a more assimilated group of Sioux children.

The simultaneous/successive results illustrate a serious mismatch between learning styles of Indian students and the teaching of beginning reading. Most beginning reading programs emphasize successive processes through a phonetic approach. However, the strength of Indian students is in simultaneous processing. The simultaneous/successive continum can be related to other cognitive style continua including FI/FD, serialism/holism, reflection/impulsivity and conceptual level (Das et al., 1979, pp. 140-144), and to the global/analytic dichotomy (Bradshaw & Nettleton, 1981, p. 51).

More (1986) identifies a continuum which he calls Trial-and-Error, Watch-then-Do. A great deal of learning in traditional Indian cultures could be described as Watch-then-Do (e.g., learning to make a fishnet) or Listen-then-Do (e.g., learning values through legends taught by an elder) or Think-then-Do (e.g., thinking through a response carefully and thoroughly before speaking). This is in contrast with Trial-and-Error learning which is often found in the classroom. This involves a student "trying out" an answer verbally and improving the answer after feedback on errors from the teacher or fellow students. Or, in skill learning, it involves trying the new skill and working on the errors to improve performance.

We know that legends and stories were the primary method of learning values and attitudes (Scollon & Scollon, 1983; Tafoya, 1982; John, 1972). The legends and stories had very deep meanings, and involved very intricate relationships - a fact often misused by non-Indians. The use of symbolism, anthropomorphism (giving human characteristics to animals, gods and objects), animism (giving life and soul to natural

phenomena such as rocks, trees, wind, etc.) and metaphors was an extremely effective method of teaching very deep and complex concepts. These methods allowed the learner to understand at his or her level of cognitive and emotional development. When the learner came back to the story or legend a few years later, it had an even deeper meaning - somewhat similar to the spiral curriculum in today's education system.

Watch-then-Do was a primary method of acquiring skills within the family group. Explanations and questions in verbal form were minimized. Supervised participation was a major characteristic of skill learning (John, 1972; Tafoya, 1982). Talking about oneself, even in a learning situation, was often considered boastful and inconsiderate (Scollon & Scollon, 1983).

Childraising practices also relate to learning. A major characteristic was that children were allowed to explore and be independent as soon as they were able. They were allowed to learn from their mistakes. A policy of non-interference existed unless there was real danger. Often misbehaviour was ignored so that the child would learn the natural consequences of misbehaviour and learn to be in charge of his or her own behaviour. Another major factor is that grandparents and other elders in the extended family were responsible for a great deal of the learning by the child (Scollon & Scollon, 1983; Tafoya, 1981). "Children are expected to constantly observe the world around them and learn from it. From this, it can be seen that one does not 'teach' a child to learn. This amount of intervention in the child's autonomy would risk forever destroying the child's ability to observe and learn from his own motives. The child is encouraged only to seek out knowledge of human experience and skills by being present in practice or their telling" (Scollon & Scollon, 1983, p. 101). However, communciation was an important part of learning. Communication was both verbal and non-verbal, but the non-verbal was much more important than in contemporary Western society. Silence was also used as a means of communication. Eye contact and quiet calmness were important methods of discipline and communication. Children were not tested or questioned after a learning situation - they were expected to self-test (Phillips, 1972;

Scollon & Scollon, 1983; Erikson & Mohatt, 1982).

To conclude this section, I have suggested (Gamlin, 1987) that the development of symbolic competence is one of the "strengths" of traditional Indian child rearing practices, a "difference" not of kind but of emphasis. As I see it, the development of symbolic competence offers the most potential for change and the ability to adapt. The use of metaphor and analogy, for example, makes it possible to generalize knowledge from one conceptual domain to another and in so doing helps students come to new insights as to the meaning of things. In this way, metaphor and analogy provide a vehicle whereby existing knowledge may be reorganized and in some cases radically restructured (see Vosniadou & Brewer, 1987). Many Indian students frequently and effectively use imaginal coding to remember and understand words and concepts. That is, they use mental images to remember or understand, rather than use word associations. This suggests that use of metaphors, images or symbols is more effective than dictionary-style definitions in helping many Indian students learn difficult concepts. The use of images or imaginal coding does not imply that the students are inferior intellectually - it simply recognizes that they have a strength in an area that many non-Indian students do not. Indeed, the use of imagery is a common feature of many gifted programmes and is used to explain some of the most abstract scientific concepts.

Closely related to the development of symbolic competence is the global, analytic; FD, FID dimension. One of the strengths and perhaps a dominant learning style for Native students is their ability to get the "big picture." Notice, however, that many topics in school are approached in an analytic, sequential manner. The topic is introduced a little bit at a time in a carefully sequenced manner. Often the overall picture, the global view, of the topic is not presented until the end of the sequence. For many Indian children (and many others) this approach would be much more effective if the overall purpose and the overall structure were described before the analytic sequence was begun. The term "advance organizers" has been used by some educators to describe

this approach. The effectiveness of first developing the overall purpose and structure is particularly effective for topics with which the student may have little direct experience (cultural relevance). It is likely that this approach would also help with motivation.

Critical Evaluation Of The Research

One is struck by the level of generality of the research on learning styles. For example, consider a major review of the educational implications of the FD-FID cognitive style completed in 1977 by Witkin and his colleagues. The review, although valuable, is extremely general. In that review, Witkin et al. (1977) examined four major questions: how students learn, how teachers teach, how students and teachers interact, and the role of cognitive style in career differentiation.

Student learning styles are known to vary in relation to cognitive style. First, relatively FD students tend to be better than FID students at learning and remembering social material. there is no known difference in sheer learning ability or memory; however, the relevance of social materials to FD students gives them the edge in this domain. Second, reflecting their external orientation FD students are likely to learn better with external reinforcements, while FID students tend to learn better under conditions of intrinsic motivation. Third, FID students have been shown to learn better than FD students when the material lacks organization; however, the level of learning does not differ when the materials are already structured. All three differences in learning styles are directly predicted by the known orientations of students with differing cognitive styles. These authors conclude that foreknowledge of the likely style of individuals or groups of students, then, will be useful in the choice and presentation of educational materials. However, as I see it, these very general comments do not provide the level of specificity necessary to proceed to programming or remediation.

Considering the work of MacArthur, Weitz, & More reported above, showing that Native students are more FID than FD, we are left with only a very general observation of learning style and nothing in the way of specific suggestions for responding to the needs of these students.

Likewise, even granting that Native students are more holistic, simultaneous and global in their approach to learning tasks, surely, we are not to believe that all Native students are equal in respect to these dimensions. And what of developmental considerations? Are we to believe that the six-year-old is just as simultaneous and just as FID, etc., as the twelve-year-old?

What is needed, it seems to me, is a developmental theory oriented to the strengths of Native students' cognitive styles; a theory that will provide theoretical guidance for developing curriculum guidelines as well as specific recommendations for an approach to remediation that is maximally responsive to Native students' needs. The enclosed paper (Appendix A) describes this kind of developmental theory in considerable detail. The central focus of the theory is on the development of metaphorical and anological thinking, exactly the kinds of cognitive skills that research has shown are the strengths of Native students. In order to think metaphorically, individuals must be simultaneous, global and holistic. They must be more FID than FD since they are able to compare really different kinds of experiences in order to draw-out the similarities between them. And because the theory is developmental in that it describes how metaphorical thinking developes progressively across five different types of thinking, from simpler to more complex, we are able to identify individual differences with respect to this kind of development. We have, if you will, a yardstick or developmental scale, from which we are able to determine individual differences. This feature of the theory is important for remedial programs in that it makes possible the comparison of entry level performance against outcome performance with respect to achieved "gains" on these specific cognitive skills.

The theory is fundamentally important because it "points outside of itself" in that it is able to describe a basic learning process that is universally valid. This basic learning process is the ability to make generalizations from prior experience to new problem tasks or new learning situations. The ability to make generalizations from the old to the new is another way of talking about significant learning. It is an objective

that all classroom teachers aspire to. Consequently, another way of characterizing the theory is to suggest that it describves how students come to make increasingly broader generalizations, to see the significance of what they have learned in a much broader context.

Although the foregoing account describes a type of universal cognitive ability, Native students should perform at higher levels of this ability than their non-Native cohorts when age is taken into consideration. This empirical finding would establish beyond question that Native students do indeed exhibit a cognitive style that is different not in kind, (because we are describing a universal cognitive ability), but in degree. This result might be forthcoming for Native students as a group.

It may very well be the case, however, that an individual Native students' performance might vary considerably from Native student group performance. Consequently, remedial action might be taken not on the basis that a cognitive skill was totally lacking in their thinking, but rather on the basis that their performance differed in some degree from the group norm. I have suggested in the accompanying paper something of the remedial action that could be taken based on the Vygotskian construct, the "zone of proximal development."

In summary, the approach advocated in this proposal is to establish that Native students exhibit a cognitive style that includes the obsevations of earlier research that they are more holistic, global, simultaneous and FID in their orientation. We do so by using a theory that describes the development of metaphorical thinking and the implications of this kind of development for students' ability to generalize. By using this particular developmental theory, we are able to demonstrate that the results have practical, educational implications, that transcend a rather narrow and abstract academic orientation. We will be able to use these results not only to point to the strengths of the traditional Native student learning style but also to develop remedial programs based on these strengths. Furthermore, curriculum objectives can be realized

by taking these strengths into consideration. In all of this, of course, we want Native students to be able to point with pride to this particular cognitive ability and to the learning style which has evolved from this kind of ability.

Specific Objectives:

1. a) To administer the assessment instrument based on the developmental theory, to Native as well as non-Native students. The distinctiveness of Native student learning styles is established.

   b) To compare the results of 1(a) to classroom performance.

2. To develop remedial programs for individual Native students based on these results taking into account particularly the learning style of these students.

3. To develop an approach to instruction, taking into account learning style and, in general, Native student strengths, to achieve specific curriculum goals in mathematics and the language arts.

Design

First Objective 1(a)

Participants

Thirty-two Native students in each of grades 1, 3 and 5 would participate for a total number of ninety-six. Sixteen of these students at each grade level would be Inuit and sixteen Native Indian. Eight of the sixteen would be girls and eight boys. In addition, thirty-two non-Native students in each of grades 1, 3 and 5 would participate for a total number of ninety-six. Sixteen of the thirty-two at each grade level would be girls and sixteen boys. Table 1 summarizes this demographic data.

Table 1

		Age									
		6			8			11			
			Boys	Girls		Boys	Girls		Boys	Girls	
Participants											
Native Students	Inuit	16	8	8	16	8	8	16	8	8	N=96
	Native Indian	16	8	8	16	8	8	16	8	8	
Non-Native Students		32	16	16	32	16	16	32	16	16	N=96

Materials

The materials are visual puzzle tasks all of which are described in the accompanying paper. Again, following on the literature review, Native student strength lies in the visual modality. Language skill requirements are minimal.

Procedure

Given the length of the assessment procedure which is fully described in the accompanying paper, only four students could be assessed in any one day. In order to adhere to a realistic time frame so as not to have a potential confound with neurological development, at least two assessors are required to reduce the total duration of the assessment period to approximately five weeks. Since we have three sets of assessment materials prepared, we might want to consider using three assessors to reduce the total duration of the assessment period to under three weeks. Since we would likely draw students from several schools, counterbalanced, of course, for the various variables under investigation, finding a space for these people should not present a problem.

First Objective 1(b)

The results of 1(a) will be compared to various classroom measures including teacher ratings for over-all learning potential as well as actual grades in mathematics and reading comprehension.

Second and Third Objectives

Before moving to the second and third objectives, the results for objective one must be evaluated.

Specific Outcomes for Objective One

1. To determine whether Native and non-Native students have similar strengths vis a vis thinking metaphorically and the ability to make generalizations. Significant differences on this dimension might establish that Native students can perform at higher levels compared to non-Native students. Since these results would reflect differences of degree rather than absolute differences, we could legitimately claim that Native students were exhibiting cognitive style differences.

2. To determine whether neurological development will affect how Native students and non-Native students perform on the assessment. We might find, for example, that Native students are better performers on the assessment compared to non-Native students across every grade level. On the other hand, we might find that Native students become better performers as a function of neurological development with increasing age. This latter result would imply that cognitive style differences emerge later on in the primary school years.

3. To determine whether Inuit and Native Indian students perform differently with respect to outcomes 1 and 2 above.

4. To determine whether the sex of the student influences 1, 2 and 3 above.

5. To determine whether the range of individual differences reflected in the assessment is comparable across all groups.

6. To determine in 1(b) the relationship between assessment results and common classroom performance indices.

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Budget

Time line	4 months
Personnel	At least one OISE research officer. And the possibility of training two individuals from the Northwest Territories to administer the assessment. Therefore, costs will vary depending upon whether these individuals are already employed by Northwest Territories Education.
OISE R.O.	$10,000.00 (approximate)
Secretarial Services	$ 500.00 (approximate)
Preparation of Final Report	$ 200.00 (approximate)
Materials: Computer diskettes, etc.	$ 200.00 (approximate)
Travel to Yellowknife OISE R.O.	(variable, depending upon number of OISE personnel involved)
Accommodation OISE R.O.	(variable, depending upon life of the project and number of OISE personnel involved)
Data Analysis: Access to mainframe computer, etc.	$ 1,500.00 (approximate)
Principal Investigator	Fee negotiated separately